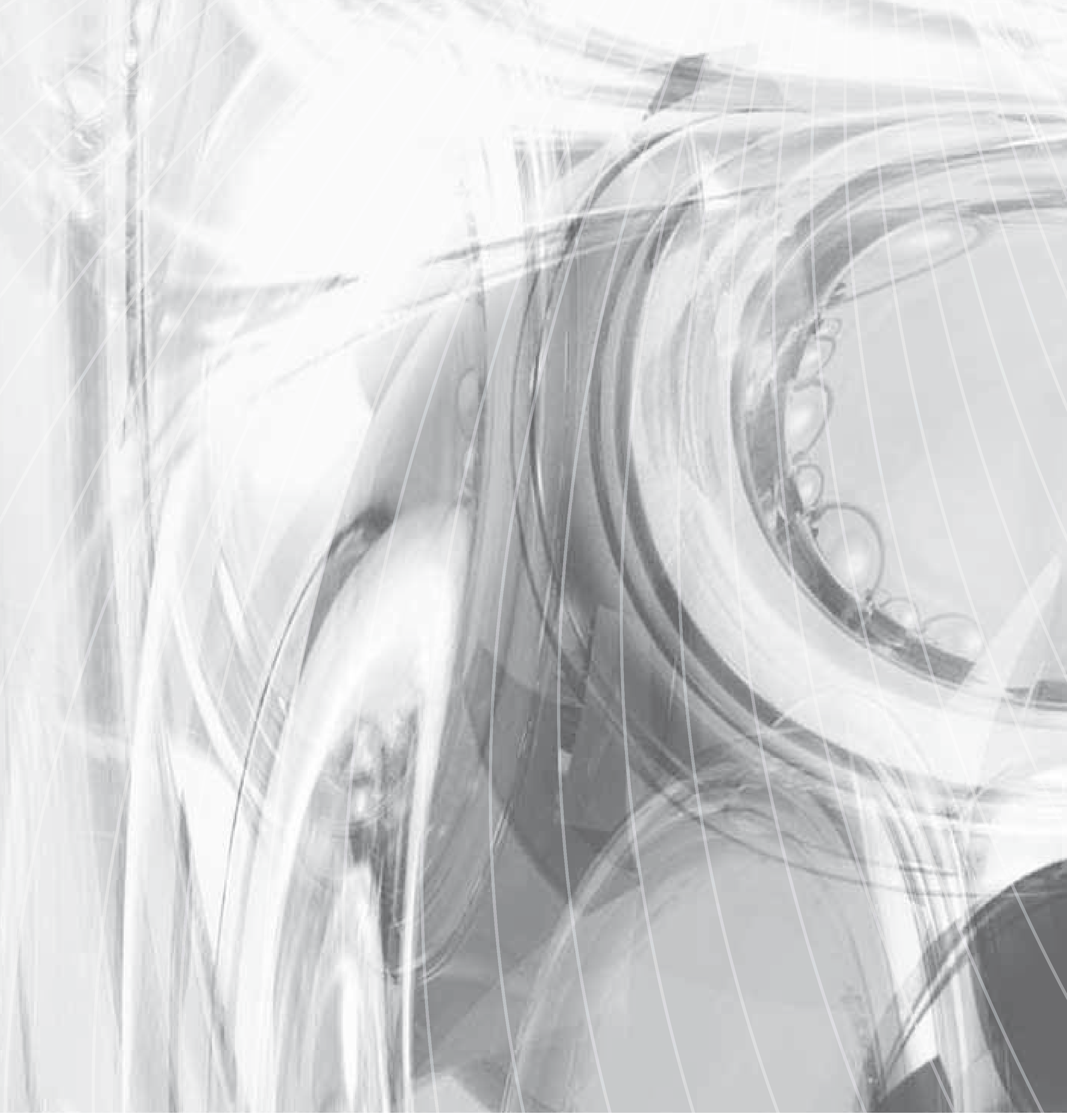
Solución a los ejercicios de cálculo integral



CAPÍTULO 1

EJERCICIO 1

1. 354
2. -40
3. $-\frac{5}{4}$
4. $\frac{223}{70}$
5. 14 560
6. 17
7. $-\frac{322}{3}$
8. $3\left(1+\frac{b}{2a}\right)$
9. 63
10. $\frac{853}{70}$
11. 414
12. 81

EJERCICIO 2

1. $57u^2$
2. $5u^2$
3. $\frac{32}{3}u^2$
4. $\frac{7}{2}u^2$
5. $\frac{10}{3}u^2$
6. $\frac{bh}{2}u^2$
7. $12u^2$
8. $2u^2$
9. $\frac{9}{4}u^2$
10. $242u^2$

CAPÍTULO 2

EJERCICIO 3

1. $\frac{x^7}{7}+C$
2. x^5+C
3. $\frac{bx^4}{4}+C$
4. $\frac{\sqrt{3}x^3}{3}+C$
5. $ax+C$
6. $\frac{3}{4}x+C$
7. $\frac{1}{3}x+C$
8. $\frac{3x\sqrt[3]{x}}{4}+C$
9. $4x\sqrt[4]{x}+C$
10. $-\frac{1}{2x^2}+C$
11. $-\frac{5}{3x^3}+C$
12. $4\ln x+C$
13. $\frac{4\sqrt[4]{x^3}}{3}+C$
14. $9\sqrt[3]{x^2}+C$
15. $\frac{5x\sqrt[5]{x^3}}{8}+C$
16. $3a\sqrt[3]{x}+C$
17. $\frac{5}{2}\ln x+C$
18. $\frac{2x\sqrt{bx}}{3}+C$
19. $\frac{15\sqrt[3]{x^2}}{2}-3x\sqrt[3]{x}+C$
20. $-\frac{3}{4x^4}+\frac{2}{x}-6\ln x+C$
21. $\frac{3t\sqrt[3]{at}}{4}+C$
22. $\frac{2t\sqrt{6t}}{3}+C$
23. $\frac{4x^6}{3}-x^5-x^4-2x^3-x^2-3x+C$
24. $\frac{ax^4}{4}-\frac{bx^3}{3}-\frac{cx^2}{2}+dx+C$
25. $\frac{x^3}{3\sqrt{a^2+b^2}}-\frac{3x^2}{2\sqrt{a}}-5\sqrt{bx}+C$
26. $\frac{x^4}{4}-2x^3-7x+C$
27. $5x^{\frac{3}{5}}-\frac{5x^{\frac{4}{5}}}{2}+C$
28. $6\sqrt[3]{x^2}-\frac{20\sqrt[4]{x^3}}{3}+C$
29. $\frac{2y^{\frac{7}{2}}}{7}-\frac{15y^{\frac{7}{3}}}{7}-\frac{8y^{\frac{5}{4}}}{5}-\frac{2y^{\frac{3}{2}}}{3}+C$
30. $\frac{2y^{\frac{5}{2}}}{5}-\frac{3y^{\frac{2}{3}}}{2}+\frac{4}{3y^{\frac{3}{4}}}+C$
31. $\frac{3t^3\sqrt[3]{t}}{2}-\frac{9t^2\sqrt[3]{t}}{7}+\frac{3t\sqrt[3]{t}}{2}+C$
32. $\frac{3t\sqrt[3]{7t}}{4}+C$
33. $\frac{(3x+4)^7}{21}+C$
34. $\frac{(ax^2-b)^6}{12a}+C$
35. $\frac{(t^3-4)^3}{9}+C$
36. $-\frac{(a-by)^5}{5b}+C$
37. $\frac{t^5}{5}-4t^3+36t+C$
38. $\frac{x^4}{4}+\frac{8x^3}{3}+8x^2+C$
39. $\frac{x^6}{6}+\frac{3x^5}{5}+\frac{3x^4}{4}+\frac{x^3}{3}+C$
40. $\frac{2(m+ny)\sqrt{m+ny}}{3n}+C$
41. $\frac{2(5x-3)^{\frac{3}{2}}}{15}+C$
42. $\frac{1}{a}\sqrt{at^2+b}+C$

43. $\frac{1}{6}\sqrt[3]{(9x-1)^2} + C$

44. $\frac{x^2}{2} - \frac{16x\sqrt{x}}{3} + 16x + C$

45. $-\frac{1}{18(3x^2-4)^3} + C$

46. $-\frac{5}{3(3x-4)} + C$

47. $-\frac{2}{3(2x^2+5)^3} + C$

48. $\frac{2\left(\sqrt{x}-b\right)^3}{3} + C$

49. $\frac{1}{a}\ln(at+b) + C$

50. $\frac{1}{6}\ln|3x^2-4| + C$

51. $\ln|x+3| + C$

52. $\ln|x^2-3| + C$

53. $-\frac{1}{(x^2-3x+6)} + C$

54. $\frac{2(x^3-6x+3)^{\frac{3}{2}}}{9} + C$

55. $-\frac{1}{an(m-1)(ay^n+b)^{m-1}} + C \ \forall\ m \neq 1$

56. $-\frac{(1-e^{3x})^3}{9} + C$

57. $-\frac{(4-\ln|x+3|)^4}{4} + C$

58. $-\frac{(1-\text{sen}\,4x)^4}{16} + C$

59. $-\frac{2(3+\cot x)^{\frac{3}{2}}}{3} + C$

60. $-\sqrt{1-\sec 2x} + C$

61. $-\frac{1}{a}\ln|1-\text{sen}\,ax| + C$

62. $\frac{4}{3}\left(e^{\sqrt{x}}-1\right)^{\frac{3}{2}} + C$

63. $\frac{(2+\ln|\text{sen}\,x|)^2}{2} + C$

64. $-\frac{1}{2(1-\cos^2 x)^2} + C$

65. $\frac{1}{3b}\text{sen}^3\,bx + C$

66. $-\frac{\cot^2 mx}{2m} + C$

67. $-\frac{\cos^3 4x}{12} + C$

68. $\frac{2\sqrt{\text{sen}\,5x+4}}{5} + C$

69. $4x - \ln(x+2)^6 + C$

70. $\frac{3x^2}{2} + 3x + \ln|(x-1)^5| + C$

71. $-\frac{1}{\ln y} + C$

72. $\frac{1}{2}\ln|\ln 3x| + C$

73. $\frac{2(ax^{n+1}+b)^{\frac{3}{2}}}{3a(n+1)} + C$

74. $\frac{1}{3}\sqrt{\left(1-\frac{1}{x^2}\right)^3} + C$

75. $-\frac{1}{3}\csc 3x + C$

76. $-\frac{1}{(x+1)^2} + \frac{3}{x+1} + 4\ln(x+1) + C$

77. $\ln\left|\frac{(x+2)^3}{(x+5)^4}\right| + C$

78. $\ln\left|(2x-1)^{\frac{3}{2}}(3x-4)^{\frac{5}{3}}\right| + C$

79. $-3\sqrt[3]{\cos x} + C$

80. $\frac{2}{5}\text{sen}^5\,x + C$

81. $2\sqrt{1-\cot w} + C$

82. $-\frac{3}{2}\sqrt{2\cos^2 y-1} + C$

83. $2\sqrt{1-\cos\alpha} + C$

84. $\frac{4}{7}\tan^{\frac{7}{4}} x + C$

EJERCICIO 4

1. $\frac{1}{4}e^{4x}+C$
2. $16\,e^{\frac{x}{2}}+C$
3. $\frac{1}{a}e^{ax+b}+C$
4. $\frac{2}{3}e^{\sqrt{3x}}+C$
5. $\frac{1}{3}e^{3x}+C$
6. $-\frac{1}{4}e^{\cos 4x}+C$
7. $\frac{2}{3}e^{x^3}+C$
8. $\frac{b^{4x}}{4\ln b}+C$
9. $\frac{3^{2x}}{2\ln 3}+C$
10. $\frac{2^x e^x}{1+\ln 2}+C$
11. $3\sqrt[3]{e^x}+C$
12. $\frac{2}{3}\sqrt{e^{3x}}+C$
13. $-\frac{1}{5^{4x}\ln 625}+C$
14. $-\frac{1}{2}e^{\frac{1}{x^2}}+C$
15. $\frac{3}{4}\sqrt[3]{e^{4x}}+C$
16. $x^3-\frac{1}{3}e^{x^3}+C$
17. $e^{x^2-3x+1}+C$
18. $-\frac{5}{2\sqrt[5]{e^{2t}}}+C$
19. $-\frac{1}{2}e^{\frac{1}{\sec 2x}}+C$
20. $-\frac{1}{8e^{2t^4}}+C$
21. $\frac{4^x\cdot e^{2x}}{2+\ln 4}+C$
22. $2\left(e^{\frac{x}{2}}-2e^{-\frac{x}{4}}\right)+C$
23. $\frac{1}{6}e^{6x}-\frac{4}{3}e^{3x}+4x+C$
24. $\frac{5^{x^2}}{\ln 25}+C$
25. $\frac{1}{4}(e^{4x}-e^{-4x})-2x+C$
26. $\frac{1}{3}e^{\tan 3x}+C$
27. $\frac{5^{x^3}}{3\ln 5}+C$
28. $\frac{10^{3x}}{3\ln 10}-\frac{2^x}{\ln 2}+C$
29. $n\left(e^{\frac{x}{n}}-\frac{1}{\ln a}a^{\frac{x}{n}}\right)+C$
30. $\frac{1}{2}(e^{2x}+5e^{-2x})+C$
31. $-\frac{1}{ae^{ax}}-x+C$
32. $-e^{\cos^2 x}+C$
33. $\frac{1}{2}e^{\text{arc sen } 2x}+C$
34. $e^{\text{arc tan } x}+C$
35. $\frac{3^{4x}(3\cdot 3^{4x}+8\cdot 3^{2x}+6)}{24\ln 3}+C$

EJERCICIO 5

1. $-\frac{1}{5}\cos 5x+C$
2. $\frac{1}{6}\text{sen } 6x+C$
3. $-4\cos\frac{x}{4}+C$
4. $\frac{1}{b}\ln|\sec bx|+C$
5. $a\tan\frac{x}{a}+C$
6. $-\frac{1}{a}\cot ax+C$
7. $\frac{1}{b}\tan bx+C$
8. $\sec x+C$
9. $-4\csc\frac{t}{4}+C$
10. $-\frac{1}{8}\cos 4x^2+C$
11. $\frac{5}{3}\text{sen}\frac{x^3}{5}+C$
12. $-\frac{1}{2}\csc^2 x+C$
13. $\frac{1}{a}\sec ax+C$
14. $\frac{3}{8}\tan 4x^2+C$
15. $-\frac{1}{3}\cot(3x-1)+C$
16. $\frac{1}{a}\ln|\text{sen}(ax-b)|+C$
17. $\frac{1}{a}\ln|\sec ax+\tan ax|+C$
18. $\frac{1}{8}\ln|\csc 4x^2-\cot 4x^2|+C$
19. $-2\sqrt{\csc x}+C$
20. $\frac{1}{b}(\tan b\theta-\cot b\theta)+C$
21. $\frac{2}{3}(\csc 3x-\cot 3x)-x+C$
22. $\frac{2}{5}(\tan 5x+\sec 5x)-x+C$
23. $\frac{1}{2}[\text{sen}^2 x-2\cos x]+C$
24. $-\frac{1}{2}\text{sen}(2-x^2)+C$
25. $\ln|\csc x-\cot x|+\cos x+C$
26. $\text{sen } x-\cos x+C$
27. $\ln|\cos x-1|+C$
28. $\cot\left(\frac{\pi}{3}-x\right)+C$
29. $-\cot w+C$
30. $\frac{1}{2}(2\tan x-x)+C$
31. $-\frac{1}{3}\cot^3 x+C$
32. $\frac{2\sqrt{\text{sen } x}(\cos^2 x+4)}{5}+C$
33. $\frac{1}{4}\ln|1-4\cot w|+C$
34. $\frac{-[x\cos x-2(\text{sen } x-1)]}{\cos x}+C$
35. $-2\ln\left|\cot\left(\frac{y}{2}\right)\right|+C$
36. $\ln\sqrt{\sec 2\alpha}+C$
37. $2\sqrt{\text{sen}^2\theta+1}+C$
38. $-\frac{1}{2}\cos(e^{2x})+C$
39. $-\frac{1}{2}\cos(\ln x^2)+C$
40. $\frac{2}{3}\ln\left|\sec\sqrt{x}+\tan\sqrt{x}\right|+C$

EJERCICIO 6

1. $\frac{1}{9}\text{arc tan}\left(\frac{x}{9}\right)+C$
2. $\frac{1}{b^2}\text{arc tan}\left(\frac{y}{b}\right)+C$
3. $\frac{1}{8}\ln\left|\frac{y-4}{y+4}\right|+C$
4. $\frac{1}{20}\ln\left|\frac{5+2x}{5-2x}\right|+C$
5. $\frac{\sqrt{2}}{16}\ln\left|\frac{\sqrt{2}x-4}{\sqrt{2}x+4}\right|+C$
6. $\frac{1}{72}\ln\left|\frac{x-4}{x+4}\right|+C$
7. $\frac{1}{3}\text{arc sen}\frac{3x}{5}+C$
8. $\frac{1}{2}\ln\left|2x+\sqrt{4x^2-7}\right|+C$
9. $\frac{1}{3}\text{arc sec}\frac{2x}{3}+C$
10. $\frac{\sqrt{2}}{2}\ln\left|x+\sqrt{x^2-4}\right|+C$
11. $\frac{4}{b^2m}\text{arc tan}\left(\frac{b^2x}{m}\right)+C$
12. $\frac{1}{2b^2}\ln\left|\frac{v^2-b^2}{v^2+b^2}\right|+C$
13. $\frac{1}{2}\text{arc tan}\left(\frac{\ln x}{2}\right)+C$
14. $\frac{1}{2}\ln\left|\frac{1+\text{sen }x}{1-\text{sen }x}\right|+C$
15. $\frac{1}{2}\text{arc sen}\left(\frac{x^2}{3}\right)+C$
16. $\frac{5\sqrt{3}}{3}\text{ arc sen}(x)+C$
17. $2\ln\left(\sqrt{e^x}+\sqrt{e^x+4}\right)+C$
18. $\frac{1}{2}\text{arc sen}\left(\frac{2\sqrt{5}y}{5}\right)+C$
19. $\frac{1}{10a^2}\ln\left|\frac{5+ay}{5-ay}\right|+C$
20. $\frac{\sqrt{3}}{3}\ln\left|\sqrt{3}t+\sqrt{3t^2+5}\right|+C$
21. $\frac{\sqrt{10}}{20}\ln\left|\frac{\sqrt{10}y+5}{\sqrt{10}y-5}\right|+C$
22. $\frac{\sqrt{3}}{3}\ln\left|\sqrt{3}x+\sqrt{3x^2+4}\right|+C$
23. $\frac{1}{b^2}\text{arc tan}\frac{x}{b^2}+C$
24. $\frac{1}{\sqrt{2}}\text{arc sen}\frac{\sqrt{2}y}{2}+C$
25. $\frac{e^{2x}}{4}\sqrt{16-e^{4x}}+4\text{ arc sen}\left(\frac{e^{2x}}{4}\right)+C$
26. $\frac{x}{2}\sqrt{1-2x^2}+\frac{\sqrt{2}}{4}\text{arc sen}\sqrt{2}x+C$
27. $\sqrt{5}\text{ arc sen}\left(\frac{\sqrt{10}\,m}{20}\right)+C$
28. $\left(\frac{2x+1}{4}\right)\sqrt{4x^2+4x+1-a^2}-\frac{a^2}{4}\ln\left(2x+1+\sqrt{4x^2+4x+1-a^2}\right)+C$
29. $\left(\frac{\sqrt{7}x^m}{2m}\right)\sqrt{49x^{2m}+4}+\left(\frac{2\sqrt{7}}{7m}\right)\ln\left(7x^m+\sqrt{49x^{2m}+4}\right)+C$
30. $\frac{\sqrt{14}}{14}\text{arc tan}\left(\frac{\sqrt{14}\,t}{7}\right)+C$
31. $\left(\frac{3}{5}\right)\sqrt{5x^2-16}+\left(\frac{2\sqrt{5}}{5}\right)\ln\left(\sqrt{5}x+\sqrt{5x^2-16}\right)+C$
32. $-\frac{\sqrt{5}}{20}\ln\left(\frac{\sqrt{5}+\cos 2t}{\sqrt{5}-\cos 2t}\right)+C$
33. $-\text{arc tan}(\cos x)+C$
34. $\frac{t\ln(3t)}{2}\sqrt{t^2\ln^2(3t)+4}+2\ln\left(t\ln(3t)+\sqrt{t^2\ln^2(3t)+4}\right)+C$

EJERCICIO 7

1. $\frac{1}{6}\ln\left|\frac{x}{x+6}\right|+C$
2. $\frac{1}{8}\ln\left|\frac{x}{x+8}\right|+C$
3. $\ln\left|\frac{x+2}{x+3}\right|+C$
4. $\ln\left|\frac{2x+1}{x+1}\right|+C$
5. $\frac{1}{9}\ln\left|\frac{x-2}{x+7}\right|+C$
6. $\frac{1}{7}\ln\left|\frac{2x+1}{x+4}\right|+C$
7. $\frac{1}{2a}\ln\left|\frac{ax+3}{ax+5}\right|+C$
8. $3\ln\left|\frac{e^x+4}{e^x+5}\right|+C$
9. $\frac{1}{7}\ln\left|\frac{2w-3}{w-5}\right|+C$
10. $\frac{1}{11}\ln\left|\frac{2\alpha-1}{\alpha-5}\right|+C$
11. $\frac{\sqrt{7}}{7}\text{arc tan}\left(\frac{\sqrt{7}(x-1)}{7}\right)+C$
12. $x+\frac{1}{4}\ln\left|\frac{e^x-1}{e^x+3}\right|+C$
13. $\frac{\sqrt{3}}{6}\ln\left|\frac{\text{sen }x-3-\sqrt{3}}{\text{sen }x-3+\sqrt{3}}\right|+C$
14. $\frac{\sqrt{5}}{5}\text{arc sen}\left(\frac{5w-11}{9}\right)+C$
15. $\frac{1}{2}\ln\left|2x-1+\sqrt{4x^2-4x+3}\right|+C$
16. $\frac{\sqrt{3}}{3}\ln\left|3z+2+\sqrt{9z^2+12z}\right|+C$
17. $\frac{\sqrt{2}}{2}\ln\left|4x+1+2\sqrt{4x^2+2x}\right|+C$
18. $\ln\left|2\ln x+7+2\sqrt{\ln^2 x+7\ln x+6}\right|+C$
19. $\ln\left|2w-9+2\sqrt{w^2-9w+5}\right|+C$
20. $\frac{x+2}{2}\sqrt{x^2+4x-3}-\frac{7}{2}\ln\left|x+2+\sqrt{x^2+4x-3}\right|+C$
21. $\frac{41\sqrt{2}}{32}\text{arc sen}\left(\frac{\sqrt{41}(4x+3)}{41}\right)+\left(\frac{4x+3}{8}\right)\sqrt{4-3x-2x^2}+C$

22. $\left(\frac{2x-3}{4}\right)\sqrt{3x-x^2}+\frac{9}{8}\text{arc sen}\left(\frac{2x-3}{3}\right)+C$

23. $\frac{(3x-2)\sqrt{3x^2-4x}}{6}-\frac{2\sqrt{3}}{9}\ln\left|3x-2+\sqrt{9x^2-12x}\right|+C$

24. $\left(\frac{2x^2-1}{8}\right)\sqrt{x^4-x^2-20}-\frac{81}{16}\ln\left|2x^2-1+2\sqrt{x^4-x^2-20}\right|+C$

25. $\left(\frac{2x+5}{4}\right)\sqrt{24-5x-x^2}+\frac{121}{8}\text{arc sen}\left(\frac{2x+5}{11}\right)+C$

26. $\left(\frac{2x+3}{8}\right)\sqrt{x^2+3x+8}+\frac{23}{16}\ln\left|2x+3+2\sqrt{x^2+3x+8}\right|+C$

27. $2\ln\left|\sqrt{x}-2+\sqrt{x-4\sqrt{x}-21}\right|+C$

28. $\frac{1}{n}\left[\left(\frac{e^{nx}-1}{2}\right)\sqrt{3+2e^{nx}-e^{2nx}}+2\text{ arc sen}\left(\frac{e^{nx}-1}{2}\right)\right]+C$

29. $\ln\left|2y+1+2\sqrt{y^2+y+1}\right|+C$

30. $\left(\frac{3x+2}{6}\right)\sqrt{3x^2+4x+1}-\frac{\sqrt{3}}{18}\ln\left|\sqrt{3\left(3x^2+4x+1\right)}+3x+2\right|+C$

31. $\frac{\sqrt{2}}{2}\text{arc sen}\left(\frac{4w-5}{5}\right)+C$

32. $\frac{2\sqrt{a}}{a}\ln\left|2\sqrt{ax}+3+2\sqrt{ax+3\sqrt{ax}+2}\right|+C$

33. $\frac{\sqrt{3}}{3}\ln\left|\sqrt{3}(6y+13)+6\sqrt{3y^2+13y-10}\right|+C$

34. $\frac{1}{2}\ln\left|\frac{(x+1)^{11}}{(3x+1)^{7}}\right|+C$

35. $-\frac{1}{6}\ln\left|(3-x)^5(3+x)^{13}\right|+C$

36. $-\frac{1}{9}\ln\left|(3x+4)^5(3x-4)^2\right|+C$

37. $\ln\left|\frac{e^x(x-\sqrt{3}-2)^{\frac{6\sqrt{3}+7}{2}}}{(x+\sqrt{3}-2)^{\frac{6\sqrt{3}-7}{2}}}\right|+C$

38. $\frac{\sqrt{73}}{438}\ln\left|(6x+5+\sqrt{73})^{\sqrt{73}+17}(6x+5-\sqrt{73})^{\sqrt{73}-17}\right|+C$

39. $\frac{1}{5}\ln\left|\frac{(x-6)^{11}}{(x-1)^{6}}\right|+C$

40. $\frac{1}{3}\ln\left|x^2+9x-5\right|+\frac{4\sqrt{101}}{101}\ln\left|\frac{2x+9-\sqrt{101}}{2x+9+\sqrt{101}}\right|+C$

41. $3\sqrt{x^2-4}+2\ln\left|x+\sqrt{x^2-4}\right|+C$

42. $-\frac{11}{3}\text{arc sen}\frac{3x}{2}-\frac{1}{3}\sqrt{4-9x^2}+C$

43. $\frac{5}{4}\ln\left|4x+\sqrt{16x^2+25}\right|-\frac{1}{8}\sqrt{16x^2+25}+C$

44. $\frac{3}{2}\sqrt{7-2x^2}+2\sqrt{2}\text{ arc sen}\left(\frac{\sqrt{14}x}{7}\right)+C$

45. $\frac{\sqrt{129}}{2580}\ln\left|\frac{(10x+\sqrt{129}-7)^{67-\sqrt{129}}}{(10x-\sqrt{129-7})^{67+\sqrt{129}}}\right|+C$

46. $5\sqrt{x^2+3x-5}-\frac{37}{2}\ln\left|2x+3+2\sqrt{x^2+3x-5}\right|+C$

47. $\frac{13\sqrt{2}}{8}\ln\left|\frac{4x+5+\sqrt{8\left(2x^2+5x-1\right)}}{e^{\frac{2\sqrt{4x^2+10x-2}}{13}}}\right|+C$

48. $-5\sqrt{4-2x-x^2}-4\text{ arc sen}\frac{\sqrt{5}(x+1)}{5}+C$

49. $\frac{7}{2}\ln\left|\frac{e^{\frac{(4x^2-2)\sqrt{x^2-3x+4}}{21}}}{(2x-3+\sqrt{x^2-3x+4})^{-1}}\right|+C$

50. $\frac{175}{16}\ln\left|\frac{e^{\frac{(16x^2+84x-2)\sqrt{x^2+7x+6}}{175}}}{(2x+7+2\sqrt{x^2+7x+6})^{-1}}\right|+C$

CAPÍTULO 3

EJERCICIO 8

1. $\frac{1}{16}\text{sen}^4 4x+C$

2. $-\frac{1}{18}\cos^6 3x+C$

3. $\frac{1}{3a}\cos^3 ax-\frac{1}{a}\cos ax+C$

4. $\frac{1}{15}\cos^3 5x-\frac{1}{5}\cos 5x+C$

5. $\frac{4}{3}\cos^3\frac{x}{4}-4\cos\frac{x}{4}+C$

6. $\text{sen}\,x-\frac{\text{sen}^3 x}{3}+C$

7. $\frac{1}{a}\text{sen}\,ax-\frac{\text{sen}^3 ax}{3a}+C$

8. $\frac{1}{6}\text{sen } 6x - \frac{\text{sen}^3 6x}{18} + C$

9. $3 \text{ sen } \frac{x}{3} - \text{sen}^3 \frac{x}{3} + C$

10. $-\cos x + \frac{2}{3}\cos^3 x - \frac{1}{5}\cos^5 x + C$

11. $-\frac{1}{a}\cos ax + \frac{2}{3a}\cos^3 ax - \frac{1}{5a}\cos^5 ax + C$

12. $-\frac{1}{4}\cos 4x + \frac{1}{6}\cos^3 4x - \frac{1}{20}\cos^5 4x + C$

13. $-2\cos\frac{x}{2} + \frac{4}{3}\cos^3\frac{x}{2} - \frac{2}{5}\cos^5\frac{x}{2} + C$

14. $\text{sen}\, y - \frac{2}{3}\text{sen}^3 y + \frac{1}{5}\text{sen}^5 y + C$

15. $\frac{1}{b}\text{sen}\, bx - \frac{2}{3b}\text{sen}^3 bx + \frac{1}{5b}\text{sen}^5 bx + C$

16. $3 \text{ sen}\frac{x}{3} - 2 \text{ sen}^3\frac{x}{3} + \frac{3}{5}\text{sen}^5\frac{x}{3} + C$

17. $\frac{1}{7}\cos^7\theta - \frac{3}{5}\cos^5\theta + \cos^3\theta - \cos\theta + C$

18. $\frac{1}{21}\cos^7 3x - \frac{1}{5}\cos^5 3x + \frac{1}{3}\cos^3 3x - \frac{1}{3}\cos 3x + C$

19. $-\frac{1}{7}\text{sen}^7 y + \frac{3}{5}\text{sen}^5 y - \text{sen}^3 y + \text{sen } y + C$

20. $-\frac{1}{28}\text{sen}^7 4x + \frac{3}{20}\text{sen}^5 4x - \frac{1}{4}\text{sen}^3 4x + \frac{1}{4}\text{sen } 4x + C$

21. $-\frac{1}{24}\cos^6 4x + \frac{1}{32}\cos^8 4x + C$

22. $\frac{1}{6}\text{sen}^6 x - \frac{1}{8}\text{sen}^8 x + C$

23. $\sqrt{\text{sen}\, 2x}\left(1 - \frac{2\text{sen}^2 2x}{5} + \frac{\text{sen}^4 2x}{9}\right) + C$

EJERCICIO 9

1. $\frac{1}{10}\tan^2 5x + \frac{1}{5}\ln|\cos 5x| + C$

2. $\tan^2\frac{x}{2} + 2\ln\left|\cos\frac{x}{2}\right| + C$

3. $-\frac{1}{8}\cot^2 4x - \frac{1}{4}\ln|\text{sen } 4x| + C$

4. $-\frac{3}{2}\cot^2\frac{x}{3} - 3\ln\left|\text{sen}\frac{x}{3}\right| + C$

5. $-\frac{1}{6}\left(\frac{\cot^4 6x}{4} - \frac{\cot^2 6x}{2} - \ln|\text{sen } 6x|\right) + C$

6. $-4\left(\frac{1}{4}\cot^4\frac{y}{4} - \frac{1}{2}\cot^2\frac{y}{4} - \ln\left|\text{sen}\frac{y}{4}\right|\right) + C$

7. $\frac{1}{20}\tan^4 5x - \frac{1}{10}\tan^2 5x + \frac{1}{5}\ln|\sec 5x| + C$

8. $-\frac{1}{15}\cot^3 5x + \frac{1}{5}\cot 5x + x + C$

9. $\frac{1}{18}\tan^3 6x - \frac{1}{6}\tan 6x + x + C$

10. $\frac{1}{6}\tan^2 3x + \frac{1}{6}\cot^2 3x + \frac{4}{3}\ln|\text{sen } 3x| + \frac{4}{3}\ln|\cos 3x| + C =$

$\frac{1}{6}\tan^2 3x + \frac{1}{6}\cot^2 3x + \frac{4}{3}\ln|\text{sen } 6x| + C$

11. $\frac{1}{6}\tan^3 2y + C$

12. $-\frac{1}{9}\cot^3 3y + C$

EJERCICIO 10

1. $\frac{1}{3}\tan 3x + \frac{1}{9}\tan^3 3x + C$

2. $\frac{1}{a}\tan ax + \frac{1}{3a}\tan^3 ax + C$

3. $6 \tan\frac{x}{6} + 2 \tan^3\frac{x}{6} + C$

4. $-\frac{1}{9}\cot 9x - \frac{1}{27}\cot^3 9x + C$

5. $-\frac{1}{b}\cot bx - \frac{1}{3b}\cot^3 bx + C$

6. $-7 \cot\frac{x}{7} - \frac{7}{3}\cot^3\frac{x}{7} + C$

7. $\frac{3}{2}\tan\frac{2x}{3} + \frac{1}{2}\tan^3\frac{2x}{3} + C$

8. $-\frac{4}{5}\cot\frac{5x}{4} - \frac{4}{15}\cot^3\frac{5x}{4} + C$

9. $\frac{1}{24}\tan^3 8x + \frac{1}{40}\tan^5 8x + C$

10. $\frac{1}{3a}\tan^3 ax + \frac{1}{5a}\tan^5 ax + C$

11. $\frac{7}{3}\tan^3\frac{x}{7} + \frac{7}{5}\tan^5\frac{x}{7} + C$

12. $\frac{1}{5}\tan^3\frac{5x}{3} + \frac{3}{25}\tan^5\frac{5x}{3} + C$

13. $\frac{1}{25}\sec^5 5x - \frac{1}{15}\sec^3 5x + C$

14. $\frac{1}{5b}\sec^5 bx - \frac{1}{3b}\sec^3 bx + C$

15. $\frac{6}{5}\sec^5 \frac{x}{6} - 2\sec^3 \frac{x}{6} + C$

16. $\frac{7}{20}\sec^5 \frac{4x}{7} - \frac{7}{12}\sec^3 \frac{4x}{7} + C$

17. $-\frac{1}{5b}\csc^5 bx + \frac{1}{3b}\csc^3 bx + C$

18. $-\frac{1}{20}\csc^5 4x + \frac{1}{12}\csc^3 4x + C$

19. $2\tan\frac{x}{2}\left(1 + \frac{2}{3}\tan^2\frac{x}{2} + \frac{1}{5}\tan^4\frac{x}{2}\right) + C$

20. $-\frac{2}{3}\left[\cot\left(\frac{3\theta}{2}\right) + \frac{1}{3}\cot^3\left(\frac{3\theta}{2}\right)\right] + C$

21. $\frac{2}{3}\left(\tan x^3 + \frac{1}{3}\tan^3 x^3\right) + C$

22. $\tan x\left(1 + \frac{2}{3}\tan^2 x + \frac{1}{5}\tan^4 x\right) + C$

23. $\tan\alpha - \frac{1}{5}\tan^5\alpha + C$

24. $\frac{1}{2}\tan 2t + \frac{1}{6}\tan^3 2t + C$

25. $-\frac{1}{3}\cot(3x-1) - \frac{1}{9}\cot^3(3x-1) + C$

26. $\frac{1}{5}\sec^5 x - \frac{2}{3}\sec^3 x + \sec x + C$

27. $\frac{1}{6}\sec^3 2x + C$

28. $-\frac{1}{7}\csc^7 x + \frac{2}{5}\csc^5 x - \frac{1}{3}\csc^3 x + C$

29. $\frac{1}{21}\sec^7 3x - \frac{2}{15}\sec^5 3x + \frac{1}{9}\sec^3 3x + C$

30. $2\sqrt{\tan x}\left(\frac{1}{9}\tan^4 x + \frac{2}{5}\tan^2 x + 1\right) + C$

31. $\frac{1}{3}\tan 3t + 2\cot\left(\frac{t}{2}\right) + \frac{1}{9}\tan^3 3t + \frac{2}{3}\cot^3\left(\frac{t}{2}\right) + C$

32. $-\frac{1}{2}\cot(2x-1) - \frac{1}{6}\cot^3(2x-1) + C$

33. $-\cot\left(\frac{\theta}{5}\right)\cdot\left[5 + \frac{10}{3}\cot^2\left(\frac{\theta}{5}\right) + \cot^4\left(\frac{\theta}{5}\right)\right] + C$

34. $-\cot x\left(\frac{1}{7}\cot^6 x + \frac{3}{5}\cot^4 x + \cot^2 x + 1\right) + C$

35. $\frac{1}{2}\tan x^2 - \frac{1}{6}\tan^3 x^2 + C$

EJERCICIO 11

1. $\frac{1}{2}x - \frac{1}{12}\text{sen } 6x + C$

2. $\frac{1}{2}x - \frac{1}{4a}\text{sen } 2ax + C$

3. $\frac{1}{2}x - \frac{5}{4}\text{sen}\frac{2}{5}x + C$

4. $\frac{1}{2}x - \frac{1}{3}\text{sen}\frac{3}{2}x + C$

5. $\frac{1}{2}x + \frac{1}{20}\text{sen } 10x + C$

6. $\frac{1}{2}x + \frac{1}{4b}\text{sen } 2bx + C$

7. $\frac{1}{2}x + \frac{7}{4}\text{sen}\frac{2}{7}x + C$

8. $\frac{1}{2}x + \frac{1}{14}\text{sen } 7x + C$

9. $\frac{3}{8}x - \frac{1}{32}\text{sen } 16x + \frac{1}{256}\text{sen } 32x + C$

10. $\frac{3}{8}x - \frac{1}{4a}\text{sen } 2ax + \frac{1}{32a}\text{sen } 4ax + C$

11. $\frac{3}{8}x - \frac{7}{4}\text{sen}\frac{2}{7}x + \frac{7}{32}\text{sen}\frac{4}{7}x + C$

12. $\frac{3}{8}x - \frac{1}{3}\text{sen}\frac{3}{2}x + \frac{1}{24}\text{sen } 3x + C$

13. $\frac{3}{8}x + \frac{1}{36}\text{sen } 18x + \frac{1}{288}\text{sen } 36x + C$

14. $\frac{3}{8}x + \frac{1}{4b}\text{sen } 2bx + \frac{1}{32b}\text{sen } 4bx + C$

15. $\frac{3}{8}x + \frac{3}{4}\text{sen}\frac{2}{3}x + \frac{3}{32}\text{sen}\frac{4}{3}x + C$

16. $\frac{3}{8}x + \frac{3}{20}\text{sen}\frac{10}{3}x + \frac{3}{160}\text{sen}\frac{20}{3}x + C$

17. $\frac{5}{16}x - \frac{1}{4}\text{sen } 2x + \frac{3}{64}\text{sen } 4x + \frac{1}{48}\text{sen}^3 2x + C$

18. $\frac{5}{16}x - \frac{1}{16}\text{sen } 8x + \frac{3}{256}\text{sen } 16x + \frac{1}{192}\text{sen}^3 8x + C$

19. $\frac{5}{16}x-\frac{1}{4a}\text{sen } 2ax+\frac{3}{64a}\text{sen } 4ax+\frac{1}{48a}\text{sen}^3 2ax+C$

20. $\frac{5}{16}x-\text{sen}\frac{1}{2}x+\frac{3}{16}\text{sen } x+\frac{1}{12}\text{sen}^3\frac{1}{2}x+C$

21. $\frac{5}{16}x-\frac{1}{10}\text{sen } 5x+\frac{3}{160}\text{sen } 10x+\frac{1}{120}\text{sen}^3 5x+C$

22. $\frac{5}{16}x+\frac{1}{4}\text{sen } 2x+\frac{3}{64}\text{sen } 4x-\frac{1}{48}\text{sen}^3 2x+C$

23. $\frac{5}{16}x+\frac{1}{12}\text{sen } 6x+\frac{1}{64}\text{sen } 12x-\frac{1}{144}\text{sen}^3 6x+C$

24. $\frac{5}{16}x+\frac{1}{4b}\text{sen } 2bx+\frac{3}{64b}\text{sen } 4bx-\frac{1}{48b}\text{sen}^3 2bx+C$

25. $\frac{5}{16}x+\frac{1}{2}\text{sen } x+\frac{3}{32}\text{sen } 2x-\frac{1}{24}\text{sen}^3 x+C$

26. $\frac{5}{16}x+\frac{5}{8}\text{sen}\frac{4}{5}x+\frac{15}{128}\text{sen}\frac{8}{5}x-\frac{5}{96}\text{sen}^3\frac{4}{5}x+C$

27. $\frac{5}{16}x+\frac{1}{4}\text{sen } 2x+\frac{3}{64}\text{sen } 4x-\frac{1}{48}\text{sen}^3 2x+C$

28. $\frac{3}{8}x-\frac{1}{12}\text{sen } 6x+\frac{1}{96}\text{sen } 12x+C$

29. $\frac{1}{2}y-\frac{1}{4}\text{sen } 2y+C=\frac{3}{8}y-\frac{1}{2}\text{sen } y+\frac{1}{16}\text{sen } 2y+C$

30. $\frac{1}{2}(x-\text{sen } x\cos x)+C$

31. $\frac{3}{8}x+\frac{1}{12}\text{sen } 6x+\frac{1}{96}\text{sen } 12x+C$

32. $x+\text{sen } x+C$

33. $\frac{19}{2}\alpha-6\text{ sen }\alpha+\frac{1}{4}\text{sen } 2\alpha+C$

34. $\frac{5}{2}x-\frac{3}{4}\text{sen } 2x-4\cos x+\frac{1}{3}\cos^3 x+C$

35. $\frac{x}{8}-\frac{b}{32}\text{sen}\left(\frac{4x}{b}\right)+C$

36. $\frac{\theta}{2}-\frac{3}{4}\text{sen}\left(\frac{2\theta}{3}\right)+4\cos^{\frac{3}{2}}\left(\frac{\theta}{3}\right)+3\text{ sen}\left(\frac{\theta}{3}\right)+C$

37. $\frac{35}{128}x+\frac{1}{4}\text{sen } 2x+\frac{7}{128}\text{sen } 4x-\frac{1}{24}\text{sen}^3 2x+\frac{1}{1024}\text{sen } 8x+C$

EJERCICIO 12

1. $\frac{1}{10}[5\text{ sen } x-\text{sen } 5x]+C=\frac{\text{sen } x}{2}-\frac{\text{sen } 5x}{10}+C$

2. $-\frac{1}{8}[\cos 4x-2\cos 2x]+C=-\frac{\cos 4x}{8}+\frac{\cos 2x}{4}+C$

3. $\frac{1}{8}\text{sen } 4x-\frac{1}{12}\text{sen } 6x+C$

4. $\frac{1}{20}\text{sen } 10y+\frac{1}{8}\text{sen } 4y+C$

5. $-\frac{1}{14}\cos 7x+\frac{1}{6}\cos 3x+C$

6. $-\frac{3}{7}\cos\left(\frac{7\alpha}{6}\right)-3\cos\left(\frac{\alpha}{6}\right)+C$

7. $\frac{10}{17}\text{sen}\left(\frac{17}{20}w\right)+\frac{10}{7}\text{sen}\left(\frac{7}{20}w\right)+C$

8. $\frac{x\cos 2b}{2}-\frac{\text{sen } 2mx}{4m}+C$

9. $\frac{x\cos 8}{2}-\frac{\text{sen } 6x}{12}+C$

10. $\frac{1}{24}\cos 6w-\frac{1}{16}\cos 4w-\frac{1}{8}\cos 2w+C$

CAPÍTULO 4

EJERCICIO 13

1. $\frac{1}{6}\ln\left|\frac{\sqrt{x^2+36}-6}{x}\right|+C$

2. $\frac{w}{5\sqrt{w^2+5}}+C$

3. $-\frac{y}{\sqrt{y^2+3}}+\ln\left(\sqrt{y^2+3}+y\right)+C$

4. $8\text{ arc sen}\left(\frac{x}{4}\right)-\frac{x\sqrt{16-x^2}}{2}+C$

5. $-\frac{\sqrt{y^2+25}}{25y}+C$

6. $-\frac{\sqrt{(36-25x^2)^5}}{180x^5}+C$

7. $6\text{ arc sen}\left(\frac{\alpha-2}{2}\right)-\frac{(\alpha+6)\sqrt{4\alpha-\alpha^2}}{2}+C$

8. $\frac{1}{4}\ln\left|\frac{\sqrt{25x^2+16}-4}{5x}\right|+C$

9. $\frac{(x^2+32)\sqrt{x^2-16}}{3}+C$

10. $-\frac{\sqrt{5-\theta^2}}{\theta}-\text{arc sen}\left(\frac{\sqrt{5}\,\theta}{5}\right)+C$

11. $\sqrt{x^2+16}+4\ln\left|\frac{\sqrt{x^2+16}-4}{x}\right|+C$

12. $-\frac{\sqrt{7-x^2}}{7x}+C$

13. $\frac{y}{\sqrt{9-y^2}}-\text{arc sen}\frac{y}{3}+C$

14. $\frac{1}{5}(3-y^2)^{\frac{5}{2}}-(3-y^2)^{\frac{3}{2}}+C$

15. $\frac{27}{2}\text{arc sen}\frac{x-3}{3}-\frac{(x+9)\sqrt{6x-x^2}}{2}+C$

16. $\frac{(w^2-14)\sqrt{w^2+7}}{3}+C$

17. $\frac{27}{8}\text{arc sen}\left(\frac{\sqrt{3}\,x}{3}\right)-\left(\frac{2x^3+9x}{8}\right)\sqrt{3-x^2}+C$

18. $\frac{\sqrt{11}}{242}\text{arc tan}\left(\frac{\sqrt{11x^2-121}}{11}\right)+\frac{\sqrt{x^2-11}}{22x^2}+C$

19. $\frac{(3x^2-8)(x^2+4)^{\frac{3}{2}}}{15}+C$

20. $2\,\text{arc sen}\left[\frac{\sqrt{2}(\ln w-2)}{4}\right]-\sqrt{4+4\ln w-\ln^2 w}+C$

EJERCICIO 14

1. $\frac{1}{3}e^{3x}\left(x-\frac{1}{3}\right)+C$

2. $\frac{1}{a}e^{ax}\left(x-\frac{1}{a}\right)+C$

3. $3e^{\frac{x}{3}}(x-3)+C$

4. $-\frac{x}{5}\cos 5x+\frac{1}{25}\text{sen } 5x+C$

5. $-\frac{x}{a}\cos ax+\frac{1}{a^2}\text{sen } ax+C$

6. $-4x\cos\frac{x}{4}+16\,\text{sen}\frac{x}{4}+C$

7. $\frac{x}{4}\text{sen } 4x+\frac{1}{16}\cos 4x+C$

8. $\frac{x}{b}\text{sen } bx+\frac{1}{b^2}\cos bx+C$

9. $3x\,\text{sen}\frac{x}{3}+9\cos\frac{x}{3}+C$

10. $\frac{x^3}{3}\left(\ln|x|-\frac{1}{3}\right)+C$

11. $x^2(\ln x^2-1)+C$

12. $\frac{x^6}{6}\left(\ln|x|-\frac{1}{6}\right)+C$

13. $\frac{x^5}{5}\left(\ln|5x|-\frac{1}{5}\right)+C$

14. $\frac{x^{n+1}}{n+1}\left(\ln x-\frac{1}{n+1}\right)+C$

15. $e^x(x^2-2x+2)+C$

16. $\frac{e^{3y}}{3}\left(y^2-\frac{2}{3}y+\frac{2}{9}\right)+C$

17. $\frac{e^{4x}}{4}\left(x^3-\frac{3}{4}x^2+\frac{3}{8}x-\frac{3}{32}\right)+C$

18. $-\frac{x^2}{3}\cos 3x+\frac{2}{27}\cos 3x+\frac{2}{9}x\,\text{sen } 3x+C$

19. $-\frac{x^2}{b}\cos bx+\frac{2}{b^3}\cos bx+\frac{2}{b^2}x\,\text{sen } bx+C$

20. $2x^3\text{sen}\frac{x}{2}+12x^2\cos\frac{x}{2}-96\cos\frac{x}{2}-48x\,\text{sen}\frac{x}{2}+C$

21. $-\frac{1}{a}x\cot ax+\frac{1}{a^2}\ln|\text{sen } ax|+C$

22. $\frac{1}{m}y\tan my-\frac{1}{m^2}\ln|\sec my|+C$

23. $x\,\text{arc cos } ax-\frac{1}{a}\sqrt{1-a^2x^2}+C$

24. $x\,\text{arc sen } bx+\frac{1}{b}\sqrt{1-b^2x^2}+C$

25. $x\,\text{arc tan } ax-\frac{1}{2a}\ln(1+a^2x^2)+C$

26. $x\,\text{arc sen } mx-\frac{1}{m}\ln\left|mx+\sqrt{m^2x^2-1}\right|+C$

27. $x\,\text{arc cot}\frac{x}{n}+\frac{n}{2}\ln\left|n^2+x^2\right|+C$

28. $\frac{1}{4}e^{2\theta}(\text{sen } 2\theta-\cos 2\theta)+C$

29. $\frac{1}{25}e^{3x}(4\,\text{sen } 4x+3\cos 4x)+C$

30. $\frac{2(5t-6)\sqrt{5t+3}}{75}+C$

31. $-\frac{(3ax+b)}{6a^2(ax+b)^3}+C$

32. $-\frac{24x^2+8x+1}{96(2x+1)^4}+C$

33. $\ln y[\ln(\ln|y|)-1]+C$

34. $-\frac{3}{8}(2x^2-2x+1)e^{2x}+\frac{1}{2}x^3e^{2x}+C$

35. $2\sqrt{x}\text{ arc cos}\sqrt{x}-2\sqrt{1-x}+C$

36. $\frac{2}{5}e^{2x}\cos x+\frac{1}{5}e^{2x}\text{sen } x+C$

37. $y(\text{arc cos } y)^2-2(\text{arc cos } y)\sqrt{1-y^2}-2y+C$

38. $-\frac{\text{arc cos } x}{x}-\ln\left|\frac{1-\sqrt{1-x^2}}{x}\right|+C$

39. $-\frac{1}{2}w\sqrt{16-w^2}+8\text{ arc sen}\left(\frac{w}{4}\right)+C$

40. $\frac{1}{2}x-\frac{1}{10}x\cos 2(\ln x)-\frac{1}{5}x\text{ sen } 2(\ln x)+C=$

$\frac{2}{5}x\cos(\ln x^2)+x\text{ sen}^2(\ln|x|)-\frac{1}{5}x\text{ sen}(\ln x^2)+C$

EJERCICIO 15

1. $\ln\frac{x^2(x+2)}{(x+1)^3}+C$

2. $\ln\frac{(2x+1)^{\frac{3}{2}}(2x-1)^{\frac{1}{2}}}{x}+C$

3. $\ln\frac{(x-3)^4(x-2)^2}{x^5}+C$

4. $\ln\frac{(x-2)^3}{x^3(x+2)^2}+C$

5. $\ln\frac{x(x+3)}{(x-3)^2}+C$

6. $\ln x^2(x-1)(x+2)^4+C$

7. $\ln x^5(2x-1)^2(x-3)+C$

8. $\ln\frac{(2x+3)^{\frac{5}{2}}}{(x+2)^3}-\frac{2}{x+2}+C$

9. $\ln(x-2)^2-\frac{3}{(x-2)}-\frac{1}{(x-2)^2}+C$

10. $\ln(x-3)^2-\frac{2}{(x-3)}-\frac{1}{(x-3)^2}+C$

11. $\ln\frac{(x+1)^2}{x}-\frac{1}{x+1}+C$

12. $\frac{1}{m-n}\ln\left|\frac{y-m}{y-n}\right|+C$

13. $w-5\ln\left|\frac{w-4}{w-5}\right|+C$

14. $\frac{1}{2}\ln\left|\frac{(y-3)(y-1)}{(y-2)^2}\right|+C$

15. $\frac{4}{x-3}+\frac{1}{3}\ln\left|\frac{x}{x-3}\right|+C$

16. $3\ln\left|\frac{\sqrt{w^2-1}}{w}\right|+C$

17. $\frac{1}{2}\ln\left|(x-2)^6(2x+1)^5\right|+C$

18. $\frac{1}{4}\ln[(w-6)^3(w+6)]-\frac{3}{w-6}+C$

19. $\frac{1}{3}\ln\left|\frac{(4x-1)^3}{3x-1}\right|+C$

20. $\frac{1}{10}\ln\left|\frac{1}{(x+4)^3(3x+2)^{\frac{1}{3}}}\right|-\frac{2}{x+4}+C$

21. $-5\ln\left|\frac{(x-3)^2}{(x-5)^3}\right|+C$

22. $\frac{x^3}{6}+\frac{27}{16}x^2+\frac{211}{32}x+\frac{595}{128}\ln|4x-1|+C$

23. $\frac{1}{32}\ln\left|\frac{x^2}{16-x^2}\right|+C$

24. $\frac{1}{30}\ln\left[\frac{x^{25}(2-x)^9}{(x+3)^{34}}\right]+C$

25. $\frac{1}{1-m}+\ln|1-m|+C$

26. $\frac{1}{20}\ln\left|\frac{y-5}{y+5}\right|-\frac{1}{2(y+5)}+C$

27. $\frac{1}{18}\ln\left|\frac{x}{x+6}\right|-\frac{2}{3(x+6)}+C$

28. $\frac{1}{8}\ln|2x-1|-\frac{8x+1}{16(2x-1)^2}+C$

29. $\frac{x^2}{2}+4x-\frac{60x^2-105x+49}{6(x-1)^3}+10\ln|x-1|+C$

30. $\ln\sqrt{x^2-9}-\frac{9}{2x^2-18}+C$

31. $\frac{1}{8x^2}+\frac{1}{4x}+\frac{7}{8(x-2)}+\frac{3}{16}\left[\ln\left|\frac{x-2}{x}\right|\right]+C$

EJERCICIO 16

1. $\ln\left|\frac{m+1}{m}\right| - \frac{1}{m} + C$

2. $\frac{1}{2}\ln\left|\frac{m^2}{m^2+1}\right| + C$

3. $\frac{x^3}{3} + \frac{1}{3}\ln\left|\frac{x^4}{(x^2-6)^{11}}\right| + C$

4. $2x + \frac{1}{3}\text{arc tan}\left(\frac{x}{3}\right) + \ln\left(\frac{x^2}{\sqrt{x^2+9}}\right) - \frac{1}{2\left(x^2+9\right)} + C$

5. $\frac{1}{4}\ln\left|\frac{y-2}{y+2}\right| - \frac{1}{2}\text{arc tan}\left(\frac{y}{2}\right) + C$

6. $\frac{x^2}{2} + x - 4\ln\left|x^2+9\right| - \frac{8}{3}\text{arc tan}\left(\frac{x}{3}\right) + C$

7. $2\ln\left|\frac{2+x}{2-x}\right| + 2\,\text{arc tan}\left(\frac{x}{2}\right) + C$

8. $\frac{1}{2}\ln\left|y^2+1\right| - \frac{2}{y^2+1} + C$

9. $\frac{1}{6}\ln\left|\frac{(x-2)^6(x+2)^2(x+1)^3}{(x-1)^5}\right| + C$

10. $\frac{1}{24}\ln\left|\frac{(x-2)^2}{x^2+2x+4}\right| - \frac{\sqrt{3}}{12}\text{arc tan}\left(\frac{\sqrt{3}(x+1)}{3}\right) + C$

11. $\frac{1}{4}\ln\left|\frac{1+y^2}{1-y^2}\right| - \frac{y^2}{2} + C$

12. $2\ln|x| + \frac{5\sqrt{2}}{2}\text{arc tan}\left(\frac{\sqrt{2}\,x}{2}\right) + C$

13. $\ln\left|(x^2+1)(x-1)^3\right| - \frac{1+2x}{2(x^2+1)} + C$

14. $\frac{9\sqrt{2}}{16}\ln\left(\frac{x+1-\sqrt{2}}{x+1+\sqrt{2}}\right) - \frac{1}{4}\left(\frac{3x+1}{x^2+2x-1}\right) + C$

15. $\ln\left|\frac{x-4}{x-2}\right| + \frac{3}{4(x-2)} + \frac{1}{4(x-4)} + C$

16. $\frac{1}{32}\ln\left|\frac{(x+2)^2}{x^2+2x+4}\right| + \frac{5\sqrt{3}}{144}\text{arc tan}\left(\frac{\sqrt{3}\left(x+1\right)}{3}\right) + \frac{x+4}{24(x^2+2x+4)} + C$

17. $\frac{x-8}{8(x^2+4)} + \frac{1}{16}\text{arc tan}\left(\frac{x}{2}\right) + \ln\left|\sqrt{x^2+4}\,(x+1)^3\right| + C$

18. $\frac{1}{2}\ln\left|x^4(x^2+5)\right| + \frac{\sqrt{5}}{5}\text{arc tan}\left(\frac{\sqrt{5}\,x}{5}\right) + \frac{3}{2(x^2+5)} + C$

19. $-\frac{(3x^2+10)}{50x(x^2+5)} + \frac{3\sqrt{5}}{250}\text{arc tan}\left(\frac{\sqrt{5}\,x}{5}\right) + C$

20. No se incluye solución por ser demostración.

EJERCICIO 17

1. $\frac{9}{2}\left[x^{\frac{2}{3}} - \ln\left|x^{\frac{2}{3}}+1\right|\right] + C$

2. $\frac{5}{3}x^{\frac{3}{5}} - \frac{5}{3}\ln\left|x^{\frac{3}{5}}+1\right| + C$

3. $\frac{(3x+1)^{\frac{5}{3}}}{15} - \frac{(3x+1)^{\frac{2}{3}}}{6} + C$

4. $\sqrt{1+x^{\frac{2}{3}}}\left[\frac{1}{5}\left(1+x^{\frac{2}{3}}\right)^2 - \frac{2}{3}\left(1+x^{\frac{2}{3}}\right) + 1\right] + C$

5. $6\left(x^{\frac{1}{6}} - \text{arc tan}\,x^{\frac{1}{6}}\right) + C$

6. $x^{\frac{5}{6}}\sqrt{x^{\frac{1}{3}}+4} - 5x^{\frac{1}{6}}\left(x^{\frac{1}{3}}-6\right)\sqrt{x^{\frac{1}{3}}+4} - 120\ln\left|x^{\frac{1}{6}} + \sqrt{x^{\frac{1}{3}}+4}\right| + C$

7. $2\sqrt{x} + 3x^{\frac{1}{3}} + 6x^{\frac{1}{6}} + 6\ln\left|x^{\frac{1}{6}}-1\right| + C$

8. $\frac{3}{2}x^{\frac{2}{3}} + 2x^{\frac{1}{2}} - 3x^{\frac{1}{3}} - 18x^{\frac{1}{6}} + \ln\left|\frac{ce^{\frac{66\sqrt{7}}{7}\text{arc tan}\frac{2x^{\frac{1}{6}}-1}{\sqrt{7}}}}{\left(x^{\frac{1}{3}} - x^{\frac{1}{6}} + 2\right)^3}\right| + C$

9. $2x^{\frac{1}{4}}\left(x^{\frac{1}{4}}+4\right) + 14\ln\left|x^{\frac{1}{2}} - 2x^{\frac{1}{4}} - 3\right| + 13\ln\left|\frac{x^{\frac{1}{4}}-3}{x^{\frac{1}{4}}+1}\right| + C$

10. $\frac{3}{7}x^{\frac{7}{6}} - \frac{3}{10}x^{\frac{5}{6}} + \frac{1}{4}x^{\frac{1}{2}} - \frac{3}{8}x^{\frac{1}{6}} + \frac{3\sqrt{2}}{16}\text{arc tan}\sqrt{2}x^{\frac{1}{6}} + C$

11. $4\sqrt{x} - 2\sqrt{5}\,\text{arc tan}\frac{\sqrt{5}\sqrt{x}}{5} + C$

12. $2(x-3)^{\frac{1}{2}} - 4(x-3)^{\frac{1}{4}} + 4\ln\left|(x-3)^{\frac{1}{4}}+1\right| + C$

13. $2\sqrt{t+2} - \frac{\sqrt{2}}{2}\ln\left|\frac{\sqrt{t+2}-\sqrt{2}}{\sqrt{t+2}+\sqrt{2}}\right| + C$

14 a 15. No se incluye solución por ser demostraciones.

EJERCICIO 18

1. $-\frac{4+3y^2}{3\sqrt{(2+y^2)^3}} + C$

2. $-\frac{1}{375}(15x^2+14)(7-5x^2)^{\frac{3}{2}} + C$

3. $\frac{4}{9}\left[\frac{x^3+36}{\sqrt[4]{90+x^3}}\right] + C$

4. $\frac{3}{1280}(20x^2-9)(3+4x^2)^{\frac{5}{3}}+C$

5. $\frac{x\sqrt{x^2+1}}{2}-\frac{1}{2}\ln\left|\sqrt{x^2+1}+x\right|+C$

6. $2\ln\left|\left(\frac{\sqrt{4+3x^4}-2}{\sqrt{4+3x^4}+2}\right)e^{\frac{\sqrt{4+3x^4}(16+3x^4)}{12}}\right|+C$

7. $\frac{1}{2}\left[\ln\left|\frac{\sqrt[4]{x^5+16}-2}{\sqrt[4]{x^5+16}+2}\right|+\text{arc tan}\left(\frac{\sqrt[4]{x^5+16}}{2}\right)\right]+C$

8. $-\frac{(4-x^4)^{\frac{1}{4}}}{4x}+C$

9. $(3+x)^{\frac{8}{3}}\left[\frac{3}{14}(3+x)^2-\frac{18}{11}(3+x)+\frac{27}{8}\right]+C$

EJERCICIO 19

1. $\frac{1}{3}\ln\left|\frac{3+\tan\frac{\theta}{2}}{3-\tan\frac{\theta}{2}}\right|+C$

2. $\frac{\sqrt{3}}{3}\ln\left|\frac{\sqrt{3}+\tan\frac{\theta}{2}}{\sqrt{3}-\tan\frac{\theta}{2}}\right|+C$

3. $\frac{1}{8}\ln\left|\frac{\tan\alpha}{\tan\alpha+8}\right|+C$

4. $\ln\left|\frac{\tan\frac{x}{2}}{\tan\frac{x}{2}+1}\right|+C$

5. $-\frac{2\left[3\tan^2\left(\frac{\beta}{2}\right)+3\tan\left(\frac{\beta}{2}\right)+2\right]}{\left[\tan\left(\frac{\beta}{2}\right)+1\right]^3}+C$

6. $\ln\left|\frac{1}{1-\cot\frac{w}{2}}\right|+C$

7. $\frac{1}{2}\ln\left|\frac{\tan^2\frac{\theta}{2}+1}{1-2\tan\frac{\theta}{2}-\tan^2\frac{\theta}{2}}\right|+\frac{\theta}{2}+C$

8. $\frac{\sqrt{10}}{10}\ln\left|\frac{3-\sqrt{10}+\tan\frac{\theta}{2}}{3+\sqrt{10}+\tan\frac{\theta}{2}}\right|+C$

9. $\frac{1}{2}\ln\left|1+2\tan\theta\right|+C$

10. $\frac{8}{15}\sqrt{15}\,\text{arc tan}\left[\frac{\sqrt{15}\tan\left(\frac{\theta}{2}\right)}{3}\right]-\theta+C$

11. $\frac{2\sqrt{11}}{11}\text{arc tan}\left[\frac{\sqrt{11}\left(2\tan\left(\frac{\alpha}{2}\right)-3\right)}{11}\right]+C$

12. $\frac{x}{2}-\frac{3\sqrt{5}}{5}\text{arc tan}\left(\frac{\sqrt{5}\tan\frac{x}{2}}{5}\right)+C$

13. $\ln\left|\left[\cos^2\left(\frac{\beta}{2}\right)\right]\cdot\left[\tan\left(\frac{\beta}{2}\right)+\sqrt{2}-1\right]\cdot\left[\tan\left(\frac{\beta}{2}\right)-\sqrt{2}-1\right]\right|+C$

14. $\frac{1}{2}\ln\left|\frac{\tan^2\left(\frac{\theta}{2}\right)+2\tan\left(\frac{\theta}{2}\right)-1}{\tan^2\left(\frac{\theta}{2}\right)+1}\right|+\frac{\theta}{2}+C$

15. $\ln\left|\frac{\left[\tan\left(\frac{\theta}{2}\right)+3\right]\left[3\tan\left(\frac{\theta}{2}\right)-1\right]}{\sec^2\left(\frac{\theta}{2}\right)}\right|+C$

16. $\frac{\sqrt{21}}{21}\ln\left|\frac{2\tan w-\sqrt{21}-5}{2\tan w+\sqrt{21}-5}\right|+C$

CAPÍTULO 5

EJERCICIO 20

1. $2y=x^2+6x-8$

2. $f(x)=\text{sen}\left(x-\frac{\pi}{2}\right)+2$

3. $y=e^x(x-1)-e^3$

4. $x\left(y+3\,\text{arc sen}\frac{3x}{2a}-3\pi\right)+\sqrt{4a^2-9x^2}=0$

5. $x=y^3-2y^2-2$

6. $x=\frac{3}{2-y}-\ln(2-y)(y+1)^2-3$

7. $y=\frac{(x^2-9)^{\frac{3}{2}}}{3}-\frac{62}{3}$

8. $16x=28-3\pi+6y-8\,\text{sen}\,y+\text{sen}\,2y$

9. $y=\frac{4+3x}{2-x}$

10. $y=4e^{2(x-\text{arc tan}\,x)}$

11. $x^3+3\cot y-3=0$

12. $s(t)=11t-15$

13. $60\,\frac{\text{m}}{\text{s}}$

14. $10\frac{2}{3}\text{m}$

15. $T=64°-2t^2$

16. 176.4 m

17. 75.776 m; $39.36\,\frac{\text{m}}{\text{s}}$

EJERCICIO 21

1. $-\frac{4}{3}$
2. 20
3. $\frac{88}{3}$
4. 6
5. $-\frac{1}{2}$
6. 6
7. $-\ln\sqrt[4]{7}$
8. $\ln 2-\frac{1}{2}$
9. $\sqrt{2}$
10. $\ln\sqrt{\frac{8}{5}}$
11. $\frac{2}{e}\left(e^{\frac{5}{2}}-1\right)$
12. $4e^5$
13. $-\frac{1}{4}$
14. $\ln\left(\frac{8}{5}\right)$
15. $\frac{\pi}{3}$
16. sen(2) − sen(1)
17. $\frac{\sqrt{2}}{2}$
18. ln(432)
19. $\frac{\pi+2}{8}$
20. $\frac{1}{2}\left(\frac{3}{2}-\ln(2)\right)$

EJERCICIO 22

1. 18u^2
2. 9u^2
3. $\frac{609}{4}\text{u}^2$
4. 18u^2
5. $\frac{32}{3}\text{u}^2$
6. 9u^2
7. $\frac{16}{3}\text{u}^2$
8. 18u^2
9. 1u^2
10. $\frac{16}{3}\text{u}^2$
11. 6u^2
12. $\frac{14}{3}\text{u}^2$
13. 8u^2
14. 36u^2
15. $\ln(16)=2.77\text{u}^2$
16. $\frac{1}{2}\text{u}^2$
17. $\frac{8}{a}\text{u}^2$ con $a\neq 0$
18. $(2-\ln 3)\text{u}^2=0.901\text{u}^2$
19. 9u^2
20. 1.388u^2
21. $(\ln 256-3)\text{u}^2=2.54\text{u}^2$
22. $\frac{\pi}{12}=0.261\text{u}^2$
23. $2(3-\sqrt{5})\text{u}^2$
24. 6u^2
25. $\frac{1}{2}(e-1)=0.859\text{u}^2$
26. $\sqrt{3}-\frac{\pi}{3}=0.684\text{u}^2$
27. $2\pi\text{u}^2$
28. $\frac{\pi^2-8}{4}=0.467\text{u}^2$
29. $\ln\left(\frac{147}{25}\right)=1.77\text{u}^2$
30. $\ln\left(\frac{16}{3}\right)=1.673\text{u}^2$
31. $(3e^{-2}-1)\text{u}^2$
32. $\left(2+\ln\left(\frac{3}{2}\right)\right)=2.405\text{u}^2$
33. $3(e^2-e)\text{u}^2$
34. $(ab\pi)\text{u}^2$

EJERCICIO 23

1. 8.72u^2
2. 10u^2
3. 0.836u^2
4. 2.413u^2
5. 1.519u^2
6. 2.6439u^2
7. 685.0499u^2

EJERCICIO 24

1. 1.139u^2
2. 14.226u^2
3. 3.5226u^2
4. 3.2069u^2
5. 1.2499u^2

EJERCICIO 25

1. $\frac{9}{2}u^2$
2. $\frac{5}{12}u^2$
3. $\frac{8}{3}u^2$
4. $9u^2$
5. $\frac{103}{18}u^2$
6. $3\left(\frac{3\pi}{2}-1\right)u^2$
7. $21.849u^2$
8. $13.33u^2$
9. $(8\pi - 16)u^2$
10. $\left[\frac{11}{4} - 6\ln\left(\frac{3}{2}\right)\right]u^2$
11. $1.94u^2$
12. $\frac{4}{3}(3\pi - 2)u^2$
13. $32u^2$

EJERCICIO 26

1. $8\pi u^3$
2. $\frac{81}{2}\pi u^3$
3. $\frac{243}{5}\pi u^3$
4. $\frac{32}{5}\pi u^3$
5. $\frac{96}{5}\pi u^3$
6. $128\pi u^3$
7. $8\pi u^3$
8. $\frac{512}{15}\pi u^3$
9. $\frac{28}{3}\pi u^3$
10. $\frac{51}{8}\pi u^3$
11. $60\pi u^3$
12. $\frac{3}{10}\pi u^3$
13. $\frac{3}{10}\pi u^3$
14. $\frac{384}{5}\pi u^3$
15. $\frac{108}{5}\pi u^3$
16. $\frac{81}{5}\pi u^3$
17. $6\pi^2 u^3$
18. $90\pi u^3$
19. $128\pi^2 u^3$
20. $4\pi^2 u^3$

EJERCICIO 27

1. 7.6337u
2. 1.4789u
3. 4.66u
4. 4.1493u
5. 4u
6. $\ln\left|\sqrt{2}+1\right| \approx .8813u$
7. $-\ln\left|2-\sqrt{3}\right| \approx 1.3169u$
8. 5.2563u
9. 1.2027u
10. $\frac{393}{20}$ u

EJERCICIO 28

1. *a*) $C(x) = 4 + 20x - \frac{x^2}{2} - \frac{x^3}{3}$

   b) $49.83
2. $I(x) = x^3 - x^2 + 5x$
3. *a*) $C(x) = 800(1.00501)^x + 200$

   b) $9945.99
4. $\begin{cases} I(x) = 4x^3 - 18x^2 + 35x \\ p(x) = 4x^2 - 18x + 35 \end{cases}$
5. *a*) $C(x) = 5\sqrt{2x+1} + 8$

   b) $113.00
6. *a*) $P(t) = \frac{2720}{3t+2}$

   b) $160.00
7. $64.00

CAPÍTULO 6

EJERCICIO 29

1. $3x^4 - 4y^3 = C$
2. $(1 - x^3)^2 = Ce^{-y^2}$
3. $y^3 - 6x^3 + 15y = C$
4. $\frac{(x-2)(y+2)}{(x+2)(y-2)} = C$, o $\frac{(x+2)(y-2)}{(x-2)(y+2)} = C$
5. $x(9 + y^2)^2 = C$
6. $(x + 2)^2 + (y + 2)^2 = C - \ln[(y - 2)(x - 2)]^8$
7. $\sqrt{x^2-2} + \sqrt{y^2-2} = C$
8. $2 - 3e^{3y} = Ce^{-9x}$
9. $\tan y - \operatorname{sen} x \cdot \cos x = C$
10. $\frac{1}{\operatorname{sen}(x+y)} - \cot(x + y) = x + C$
11. $\left(\frac{x}{x-6}\right)^2\left(\frac{y-4}{y}\right)^3 = C$

12. $4x^4 - y^4 = C$
13. $y^4 + 4y = 4x^2 + 4x + C$
14. $y = Ce^{e^x}$
15. $x^3y^2 = C$
16. $3y + 12 \ln y = x^3 - 3x + C$
17. $\sqrt{\csc 2y - \cot 2y} = Ce^{\frac{x^3}{3}}$
18. $2e^{3y} - 3e^{2x} = C$
19. $x = e^{\frac{c}{y}}$
20. $e^y(y - 1) + \ln(e^{-x} + 1) = C$

EJERCICIO 30

1. $Cx^2 - 2x - y = 0$
2. $y = \dfrac{2Cx^3}{1 - Cx^2}$
3. $Cx^4 - 2x^2 - y^2 = 0$
4. $y = \dfrac{x - Cx^{-\frac{1}{2}}}{3}$
5. $Cx^4 + 3x^2 - y^2 = 0$
6. $y = e^{\frac{2Cy^2 - x^2}{2y^2}}$
7. $\ln x - \dfrac{x}{y - 2x} = C$
8. $y = -\dfrac{\sqrt{3}}{2}\, x \tan\left(\dfrac{\sqrt{3}}{2} \ln Cy\right) + \dfrac{x}{2}$
9. $y = x \tan\left(\ln C(y^2 + x^2)^4\right)$
10. $x^4 = Ce^{\operatorname{sen}\frac{y}{x}}$
11. $y^2 - 2xy + 2x^2 = C$
12. $y = Cx^2 - \sqrt{x^2 + y^2}$
13. $y^2 + 2xy - x^2 = C$
14. $\ln|x| + e^{-\frac{y}{x}} = C$
15. $x^2 - y^2 = C$
16. $x + 2y + 3 \ln|x + y - 2| + C$
17. $x^2 + 2xy - y^2 - 4x + 8y = C$
18. $x + 3y + 2 \ln(2 - x - y) = C$
19. $(4y - x - 3)(y + 2x - 3)^2 = C$